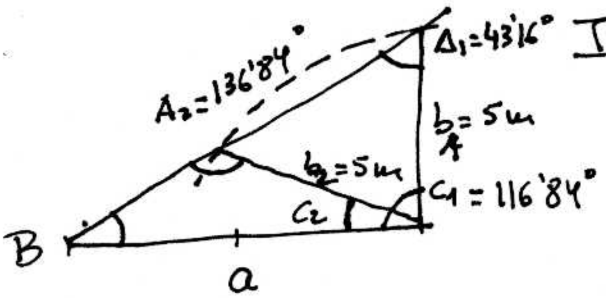
23/III/2011

CORRECCIÓN

PRUEBA 2ª EVALUACIÓN 1º BTO C-T.

1.- Resolver $a = 10m$; $b = 5m$ $B = 20°$.



T. SENO:

$$\frac{a}{\operatorname{sen} A} = \frac{b}{\operatorname{sen} B}; \quad \operatorname{sen} A = \frac{a \cdot \operatorname{sen} B}{b}$$

$$\operatorname{sen} A = \frac{10 \operatorname{sen} 20°}{5} = 0'6840 \begin{cases} \boxed{A_1 = 43'16°} \\ \boxed{A_2 = 180 - A_1 = 136'84} \end{cases}$$

1ª SOL

$$\boxed{C_1 = 180 - (B + A_1) = 116,84°} \Rightarrow \frac{b}{\operatorname{sen} B} = \frac{c_1}{\operatorname{sen} C_1}; \boxed{c_1 = 13,04 \text{ m}}$$

2ª SOL:

$$\boxed{C_2 = 180 - (B + A_2) = 23'16°} \Rightarrow \frac{b}{\operatorname{sen} B} = \frac{c_2}{\operatorname{sen} C_2}; \boxed{c_2 = 5'75 \text{ m}}$$

Cuestión: Si $B > 31°$ y aplicamos el T. del seno para calcular el sen A, ocurre que:

$$\operatorname{sen} A = \frac{10 \cdot \operatorname{sen} B}{5} > 1 \Rightarrow$$ No es válido. No se puede construir el triángulo si $B > 31°$

2.- a) $\tan x = -3$; $x = \operatorname{arctg}(-3) = -71'56505°$.

$$x_1 = -71'56505 + 360° = \boxed{288,4449° \quad (4° \text{ cuadrante}) = x_1}$$

En el 2º cuadrante: $x_2 = x_1 - 180° = \boxed{108,4349° = x_2}$

b) $2 \operatorname{sen} x \cos x = -\frac{1}{2} \Rightarrow \operatorname{sen} 2x = -\frac{1}{2}$; $2x = \operatorname{arcsen}\left(-\frac{1}{2}\right)$

$2x = -30° \Rightarrow$ $2x = 360° - 30°$; $2x = 330°$; $\boxed{x_1 = 165°}$

$\quad$ $2x = 180 + 30°$; $2x = 210°$; $\boxed{x_2 = 105°}$

c) $\cos 2x + 5\cos x + 3 = 0$

$\cos^2 x - \text{sen}^2 x + 5\cos x + 3 = 0$

$\text{sen}^2 x = 1 - \cos^2 x \Rightarrow \cos^2 x - (1 - \cos^2 x) + 5\cos x + 3 = 0$

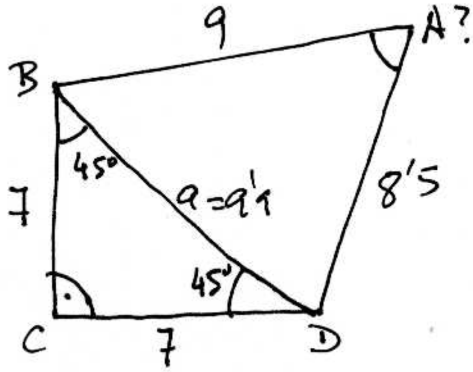
$2\cos^2 x + 5\cos x + 2 = 0; \quad \cos x = \frac{-5 \pm \sqrt{25-16}}{4} =$

$= \frac{-5 \pm 3}{4}$ → $\cos_1 x = \frac{-5+3}{4} = \frac{-2}{4} = -\frac{1}{2}$

→ $\cos_2 x = \frac{-5-3}{4} = \frac{-8}{4} = -2 \Rightarrow$ Solución no posible

$x = \arccos\left(-\frac{1}{2}\right) \to \boxed{\begin{array}{l} x_1 = 120^\circ \\ x_2 = 360^\circ - 120^\circ = 240^\circ \end{array}}$

3



En $\widehat{ABD}$, el lado "a" es la hipotenusa correspondiente al triángulo $\widehat{BCD}$.

Calculamos "a" por el teorema de Pitágoras: $a^2 = 7^2 + 7^2 = 7\sqrt{2}$ u.

$\boxed{a = 9'90\,u}$

En $\widehat{ABD}$ aplicamos el T. del coseno para hallar el ángulo $\hat{A}$: $a^2 = b^2 + c^2 - 2bc\cos A$; $\cos A = \frac{b^2+c^2-a^2}{2bc}$

$\cos A = \frac{9^2 + 8'5^2 - (7\sqrt{2})^2}{2 \cdot 9 \cdot 8'5} = \frac{13}{36} = 0'36\hat{1}$; $\boxed{A = \arccos(0'36) = 68'83^\circ}$

Area: $S_{BCD} = \frac{7 \times 7}{2} = \frac{49}{2}\,u^2 = \boxed{24'5\,u^2 = S_{BCD}}$

$S_{ABD} = \sqrt{p(p-a)(p-b)(p-d)} = \sqrt{13'7(13'7-9'9)(13'7-9)(13'7-8'5)} =$

$p = \frac{a+b+d}{2} = \frac{9'9+8'5+9}{2} = 13'7 \qquad = \boxed{35'67\,u^2 = S_{ABD}}$

$\boxed{\text{Area Total} = 60'17\,u^2}$

4.- a) $|\vec{u}| = 5; \quad \vec{u} = (z, -3)$

$|\vec{u}| = \sqrt{z^2 + (-3)^2} = \sqrt{z^2+9} = 5; \quad z^2 + 9 = 25; \quad z^2 = 16$

$\boxed{z = \pm\sqrt{16} = \pm 4} \Rightarrow \begin{cases} \boxed{\vec{u}_1 = (4, -3)} \\ \boxed{\vec{u}_2 = (-4, -3)} \end{cases}$

b) $\vec{u} \cdot \vec{v} = 23$ con $\vec{u} = (z, -3)$ $\vec{v} = (2z, 3)$

$\vec{u} \cdot \vec{v} = (z, -3) \cdot (2z, 3) = 2z^2 - 9 = 23; \quad 2z^2 = 32; \quad z^2 = 16$

$z = \pm\sqrt{16} = \boxed{\pm 4 = z}$

c) $\vec{u} \perp \vec{v} \Rightarrow \vec{u} \cdot \vec{v} = 0 \Rightarrow (z, -3) \cdot (2z, 3) = 0$

$2z^2 - 9 = 0; \quad 2z^2 = 9; \quad z^2 = \frac{9}{2}; \quad z = \pm\sqrt{\frac{9}{2}} = \pm\frac{3}{\sqrt{2}}$

$\boxed{z = \pm\frac{3\sqrt{2}}{2}}$

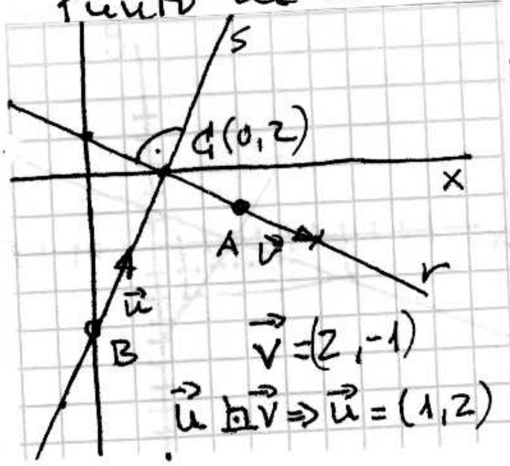
5 $r: \begin{cases} A(4, -1) \\ \parallel \vec{v}(2, -1) \end{cases}$ F. vectorial: $\boxed{(x, y) = (4, -1) + \lambda(2, -1)}$

F. continua: $\boxed{\frac{x-4}{2} = \frac{y+1}{-1}}$

$s: \begin{cases} B(0, -4) \text{ (Ord. Origen } -4) \\ \perp r \Rightarrow \vec{u}(1, 2) \end{cases} \Rightarrow \boxed{s: \frac{x-0}{1} = \frac{y+4}{2}}$

Punto de corte: $r: -x+4 = 2y+2$; $\begin{cases} x+2y-2=0 \\ 2x-y-4=0 \end{cases}$

$s: \quad 2x = y+4$



$r: \quad x + 2y - 2 = 0$

$2 \cdot s: \quad 4x - 2y - 8 = 0$

$5x \qquad -10 = 0$

$\boxed{x = 2}$

Las rectas se cortan en $C(2, 0)$ $\quad 2 + 2y - 2 = 0; \; 2y = 0$

$\boxed{y = 0}$